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ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

Rearing and Training Deer for Food Habits Studies

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Wild does are tropped in winter ond held until after fawning. Fawns are left with the doe ot leost 12 hours to assure feeding of calostrum, but less than 24 hours to prevent development of wildness. Relionce on the humon troiner develops thraugh bottle feeding ond frequent contoct. Initial training for field use requires 4 ta 6 weeks, but cantinuous reheorsol is necessory.

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The study of food habits is a major research activity in wildlife ecology. Most of the work in this field has involved analysis of stomach contents or feces, or observation of wild animals. But in an effort to acquire more exact information about specific habitats, many workers have used tame animals—for example, Dzieciolowski (1966) observed tame red deer, Bergerud and Nolan (1970) caribou, Wallmo (1951) and Hoover (1971) pronghorn antelope. Healy (1967), McMahan (1964), Wallmo and Neff (1968), and Watts (1964) discussed the use of deer (Odocoileus spp.) for such purposes.

This Note reviews the methods we have used to rear and train Rocky Mountain mule deer (O. hemionus hemionus) for use in food habits studies and grazing experiments.

Acquisition and Initial Handling of Fawns

Over a period of 5 years we have obtained newborn fawns that were captured in the wild, born in pens from wild does trapped the preceding winter, or born of does that were raised in pens. We have found no differences in the adaptability of fawns from these sources. We learned early, however, that fawns left with their mothers more than 2 or 3 days, whether in the woods or in pens, usually are too wild to train. Yet, if we take fawns from penned does as soon as they are cleaned and able to stand, we have high incidence of sickness and mortality. Best results are obtained if the fawn is left with its dam for at least 12 hours but less than 24 hours. This permits the fawn to suckle and obtain colostrum, but exposes it to the surrogate mother (trainer and bottle) before fear of humans is imprinted.

Most of our fawns have been born late at night or early in the morning. As soon after birth as possible, usually within 3 to 6 hours, tincture of iodine is applied to the navel to prevent infection. During the first day the fawns are closely observed to assure that they are being nursed. If they are rejected or unable to nurse, they are taken immediately and bottle fed. While we have fed cow colostrum to sucking fawns, we have more confidence in natural colostrum. Doe's milk contains colostrum at a relatively high level and is rich in vitamin A for 3 days (Youatt et al. 1965). After 12 hours, however, antibodies of colostrum are no longer beneficial to the nursing fawn (personal communication, Dr. David Varra, Veterinary Science Department, Colorado State University).

In our first attempts, the parturient does were in pens at Fort Collins, Colorado, and the fawns were raised in a residential back yard. Because of high incidence of disease and mortality, we subsequently trapped wild does in winter and placed them in a pen constructed on nearby winter range. As the fawns were born they were removed to pens on

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summer range at the Fraser Experimental Forest. Several pens of 4-foot-high snowfence, each about 50 by 50 feet in size, were constructed so that two to four fawns could be kept in each with a distance of 20 to 30 feet between pens to minimize possible contagion. These pens are in a forest stand and contain a variety of natural forages. We have had very little disease and no mortality at this site. However, during 1971, our cooperators in the Department of Fishery and Wildlife Biology, Colorado State University, have also had considerable success with fawns born and raised in pens at Fort Collins.

Feeding

There is some published information on the composition of deer milk (Kitts et al. 1956 for black-tailed deer, Odocoileus hemionus columbianus; Silver 1961, and Youatt et al. 1965 for white-tailed deer, Odocoileus virginianus). However, feeding formulas recommended in these and other reports (Aldredge 1971, Murphy 1960, Trainer 1962, Long et al. 1961) are so contradictory they are not helpful. Likewise, the successes and failures of others with whom we have had personal contact have little in common.

We have tried a variety of formulas, and have had best results with one made up of five parts evaporated canned milk and three parts water. We add 0.3 cc. of pediatric vitamins to two feedings each day to provide adequate vitamins A and C. Quantities per feeding and feeding schedules are shown in figure 1. Eight-ounce plastic baby bottles are used; filled to capacity they hold 10 ounces. Because fawns are voracious nursers (fig. 2), the nipple holes are slightly enlarged to accommodate their appetite. All milk utensils are washed and sterilized in boiling water prior to each feeding.

We consider "tender loving care" (fig. 2) to be an essential element throughout the rearing period. At each feeding, the trainer takes extra time to bestow some affection on each fawn.

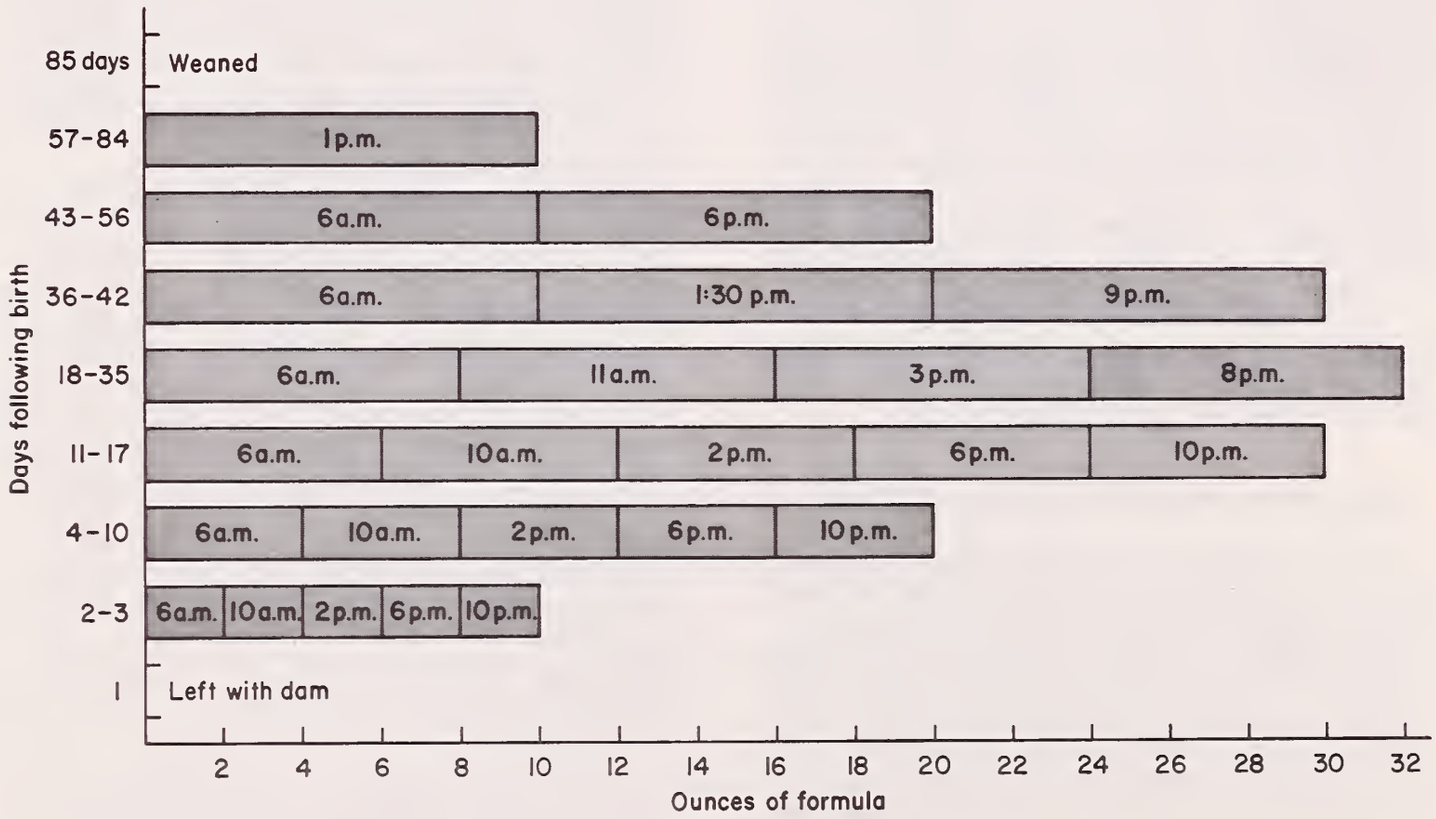

Figure 1.--Daily time schedule and cumulative amount of special formula bottle-fed to each fawn from second day following birth until weaned. Formula was five parts evaporated canned milk, three parts water; 0.33 cc. of pediatric vitamins added to two feedings each day.

Figure 2.--Trainer fondles each fawn at each feeding to tame and train it for field use. (Photos courtesy of Colorado Game, Fish and Parks Div.)

At about 2 weeks of age the fawns begin to graze natural forage available in their pens. At this time a bucket of water is placed in each pen. At 1 month a small amount of commercial lamb creep feed is placed in each pen; the amount is gradually increased until it is available ad libitum. At 2 months the creep feed is mixed 50/50 with a specially made ration consisting of ground chopped corn, barley, milo, and bran. Molasses and Purina [2] special protein supplements are also added. Protein content of this ration is 20 percent. From 2 to 3 months the proportion of creep feed is reduced and finally eliminated. Alfalfa hay is introduced at about 1 month.

Sickness

Dietary upsets and bacterial infections resulting in diarrhea are the only common sicknesses we have encountered. Kramer et al. (1971) reported three strains of Escherichia coli as causing high mortality in our fawns in 1969. Salmonella and Clostridium were isolated from some of our fawns in 1968. Salmonella has been reported as a common pathogen in white-tailed deer fawns (Cook et al. 1971, Debbie 1968, Robinson and Marburger 1970).

Diagnosis and proper treatment of fawns with these bacterial infections have not yet been resolved, nor do we have conclusive recommendations for the recognition and treatment of diarrhea caused by improper diet. However, we have developed a number of lay practices. The fawns are closely observed to insure early recognition of digestive upset or infection. At each feeding, the anal and rump areas of animals with diarrhea are cleaned with a wet sponge and dry napkin, primarily to minimize fly contact. Pens are cleaned of droppings at least once a day. If possible, sick animals are transferred to a separate pen. When we see an apparent dietary problem, one teaspoon of Corrective Mixture, a product of Massengill Co., is added to the milk twice daily. Neomix Plus, a product of the Upjohn Co., also appears to be effective for diarrhea control.

[2] *Trade names and company names are used for the benefit of the reader and do not imply endorsement or preferential treatment by the U. S. Department of Agriculture.*

Training for Field Use

Our training program has five major objectives:

1. To establish the deer's confidence in and reliance on the trainer.
2. To teach the deer to follow the trainer, an aptitude which comes somewhat naturally from the first.
3. To teach the deer to accept the placement and removal of a harness.
4. To train the deer to accept leading with a rope attached to the harness.
5. To train the deer to load in and out of, and ride in, the truck used for transportation to study area.

The first objective is accomplished by acquiring the fawn at an early age, by the feeding program, and by frequent empathetic contact throughout the deer's life. Empathy is important, but you either have it or you do not, and not much more can be said about it. In order for the deer to become adequately imprinted, it is imperative that one and not more than two people be responsible for all the rearing and training work. However, a general requirement applicable throughout is that all activities around the deer be conducted as slowly, patiently, and quietly as possible.

At 10 to 14 days of age, fawns are let out of the pen to follow the trainer on walks in the field. At this age, the fawn's attachment to the trainer should be comparable to that of a normal fawn to its mother.

Harness training begins at the same time. Healy (1967) and Neff (1967) describe deer harnesses from which our present model evolved. Two 1/8- by 1-inch nylon straps, one around the base of the neck and the other around the body just behind the shoulders, are connected dorsally by a third strap sewed to the neckpiece and connected by a snap to a ring on the body piece (fig. 3). Five to six harnesses of increasing size are needed to accommodate the deer from age 2 weeks to 2 years, after which growth is negligible.

While Neff (personal communication) saw advantages in a ventral connection of the harness pieces and leashing at the brisket, we have found the dorsal connection and leashing from above the shoulder to provide better control.

Initially only the neckpiece is used on the fawn until it is obvious that the entire harness would be accepted without fear. The harness is then put on and removed several times each day until this has become a familiar routine. Deer are never left harnessed and unattended because of the chances of strangulation. Leading is a crucial phase of training, both for the

Figure 3.--Harness training begins when fawn is 10 to 14 days old. Two-piece harness and leash are used to teach the tamed deer to lead.

deer and the handler. The deer must learn to accept some restraint, but is inherently capable of tolerating only a limited amount. We use a 12-foot, 3/8-inch soft nylon rope for a leash. The rope is usually held 1 to 2 feet from the harness, at most 3 feet, and the additional length is used solely for emergency situations. This position permits gentle guidance in any direction, provides the opportunity to release tension quickly without losing control, and minimizes the chance of the rope entangling the deer. The dorsal attachment of the leash results in a lifting pressure on the chest which the deer seem to accept without panicking. Very little tension is felt around the neck, which appears to be important. A gentle push on the rump helps guide the deer forward or to either side (fig. 4).

Training to load, ride, and unload is begun at about 10 days by enticing two fawns at a time into the truck at feeding periods with the nursing bottle. After being fed, petted, and played with in the truck on several occasions they lose their fear of the truck. They are then taken on short rides to get them accustomed to the movement of the vehicle and learn that the experience ends without harm.

A truck with a closed canopy, such as our custom-built unit, is imperative (fig. 4).

Figure 4.--Tamed deer willingly leave and return to the canopy-covered utility-bed pickup truck used to transport them to and from the study area.

Next, the deer are taken in pairs on simulated field trials. They are harnessed, led to the truck with leash attached, loaded and driven to an unfamiliar location where they are released and allowed to wander and graze at will for 1/2 to 1 hour. During this period the leash is not used. The trainer then trots or walks at a fast pace back to the truck. If the early conditioning has been successful, the deer willingly follow the trainer to the truck where the leash is attached to facilitate loading. Many deer leap in the truck before the leash is attached.

This field training procedure is rehearsed at least once a day with each deer over a period of 4 to 6 weeks. The total training program is completed within 2 months. It must be rehearsed routinely, however, at least once and preferably twice a week throughout the deer's life to maintain an acceptable level of compliance. While we have maintained trained deer only to 2 years of age, D. J. Neff (personal communication) has used tame deer up to 5 years of age.

Some deer have an inherent wildness and never become tractable enough for use. At about 2 months of age these deer can be recognized and eliminated. Males will become intractable at yearling age if not castrated. We castrate with an elastrator and bands at about 3 months.

Deer remain in the handler's control in the field primarily because they do not like to be separated from their human companion. If the handler follows a deer, it will choose its own route and rate of travel (fig. 5). If the handler walks away—for example, to another study or back to the truck—the deer will follow. Low bleating sounds, with which the deer have been acquainted from birth, tend to reassure them and persuade them to follow.

Of 22 deer that we have raised and trained for this work, only two—which we feel were inherently unsuited—failed to adapt to our needs.

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Figure 5.--Trainer observes and tape records food habits of tamed deer. (Photo below courtesy of Colorado Game, Fish and Parks Div.)